



Snake Information for Natural Resource Service Field Staff

Alberta Environmental Protection,
Natural Resources Service
Wildlife Management Division
Edmonton, Alberta

October, 1997

Introduction

The snake is considered one of the most disliked animals in the world. Their appearance and nature have contributed to people's dislike of them. The fact that only a few snakes have powerful venoms has created the myth that all snakes are poisonous (Oliver 1958). This booklet was created to provide field staff with useful information about the snakes in Alberta, and help them respond to complainants' questions about them.

The importance of reptiles in Alberta is great. First, reptiles constitute a huge biomass of the ecosystems they live in. Second, because they are poikilothermic (body temperature varies with that of the immediate surroundings), reptiles require less energy to grow and reproduce, therefore, they contribute a large amount of usable energy to the food web (Russell and Bauer 1993). They provide an important food source to other snakes, wild birds (hawks, owls, cranes, herons), and mammals (skunks, bears, badgers, racoons, and coyotes).

Reptiles are beneficial to agriculture, consuming large numbers of insects that cause damage to crops. Snakes will also eat frogs, lizards, fish, birds, and mice. Snake venoms are also being used in many beneficial drugs.

Regulations Regarding Reptiles

Non-game species – Western Hognose Snake, Prairie Rattlesnake

Non-licence species – Bull Snake, Plains/Wandering/Red-sided Garter Snakes

Wildlife Act

- 27 (1) A person shall not hunt (i. shoot at, harass; ii. Chase, pursue; iii. Capture or wilfully injure or kill; iv. Attempt to injure or kill) wildlife outside an open season or if there is no open season for that wildlife.
- 38 (1) A person shall not wilfully molest, disturb or destroy a house, nest or den of wildlife prescribed by the minister in areas and at times prescribed by the minister.

General Wildlife Guidelines

- 96 Section 38(1) of the Act applies:
- (a) to the nests and dens, so far as applicable, of
 - (iii) snakes and bats, throughout Alberta and from September 1 in one year to April 30 in the next.
- 135 A person may possess any live non-licence animal except a racoon or a bat of a kind that is a wildlife animal.

In the United States snakes are considered non-game wildlife, and are protected year-round by law in most states, unless they are causing personal or property damage (Byford 1994). Because Alberta's regulations do not protect some species of snakes away from the den, we need to educate the public about the importance of snakes in the environment, and how harmless they are. Habitat destruction and direct killing of snakes are the leading causes of declines. Because of fear, many people kill every snake they can, never realizing the value they have in our ecosystem.

Status of Alberta's Reptiles

There is concern expressed over all of our species of reptiles. We know very little about their biology, and even less about their populations. The Snake Hibernaculum study is the first step to understanding the basic distribution of the snakes of Alberta.

Blue List - species may be at risk, information is limited, more detailed work required

| | |
|-----------------------|------------------------------|
| Prairie Rattlesnake | <i>Crotalus viridis</i> |
| Short-horned Lizard | <i>Phrynosoma douglassii</i> |
| Western Hognose Snake | <i>Heterodon nasicus</i> |

Yellow A - concern expressed over long-term declines in numbers, may be in trouble

| | |
|------------------------|----------------------------|
| Plains Garter Snake | <i>Thamnophis radix</i> |
| Red-sided Garter Snake | <i>Thamnophis sirtalis</i> |
| Wandering Garter Snake | <i>Thamnophis elegans</i> |

Yellow B - species naturally rare, species has clumped distribution, associated with habitats or habitat elements that are, or may be deteriorating

| | |
|------------------------|-------------------------------|
| Bull Snake | <i>Pituophis melanoleucus</i> |
| Western Painted Turtle | <i>Chrysemys picta</i> |

Habits

Snakes are cold-blooded and are therefore very sensitive to variations in temperature. They must have protection from the cold winters, and will overwinter in dens or hibernacula. The snakes will congregate in large numbers in the fall, when temperatures become too cold for them. The hibernaculum may be a crevice or hole in the ground or in rocky outcrops (Russell and Bauer 1993). Staff may find more snake complaints in the fall, when the snakes are congregating for denning, or in the early spring, when the snakes are dispersing for the summer.

Mating usually occurs just as the snakes are leaving the dens. Most snakes mate within a month after coming out of hibernation. The Garter Snakes and Prairie Rattlesnake are live bearers. Up to 92 young Plains Garter Snakes have been produced in a single birth (Russell and Bauer 1993). The Western Hognose Snake and Bull Snake both lay eggs and the young hatch in about 50-60 days. Young snakes are completely independent, and never receive any parental care.

Of the six species of snakes in Alberta, only the Prairie Rattlesnake possesses a venom that is harmful to humans. The garter snakes and Western Hognose Snake all possess a venom that is extremely mild, and generally does not produce a reaction in humans (although in some cases the bite of the hognose snake can be unpleasant). The Bull Snake does not have venom, but bites can still be painful.

Snake bites world-wide are a relatively serious health threat, but here in North America the problem is very small. Of the 45 000 snakebites annually in the United States, only 7-8 000 are by

venomous snakes (about 16%), and there are generally fewer than 15 deaths (0.03%). There are no documented fatalities due to snakebites in Alberta. Most hospitals in southern Alberta (Milk River, Medicine Hat, Lethbridge, Brooks, Calgary Foothills) have antivenom, although, it is not always necessary to administer it, as it can cause bad reactions in some people (Russell and Bauer 1993).

How to Deal With Snakes

1. Exclusion

Snakes can enter houses and other buildings through very small openings (1/4 inch, 0.6 cm). They are attracted to damp, cool, dark areas like basements. After snakes have left the hibernaculum in the spring (early May), these holes can be plugged up using mortar, fine hardware mesh or sheet metal. A hardware mesh fence (1/4" max. diameter) can be built around areas away from the house that need to be protected.

2. Habitat Modification

Keeping vegetation mowed around buildings and removing low lying branches of shrubs and trees, will reduce the numbers of snakes in an area. Ensure there is nothing attracting small mammals and insects to the area, as snakes are attracted to these food sources.

3. Trapping and Removal (Alberta Agriculture 1991)

- do not try and catch the snake with your hands, unless you are absolutely sure it is harmless.
- funnel traps work well for removing unwanted snakes without killing them. Drift fences are built with hardware cloth and these guide the animals into a single open-ended funnel (made from rolled up hardware cloth or PVC piping)
- placing a pile of damp burlap bags in areas where snakes have been seen, will attract them. Once you have a snake in the pile, you can wrap it up and return it to a wilderness place.

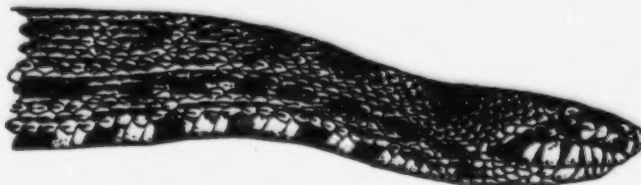
4. If a poisonous snake bite is suspected, Russell and Bauer (1993) suggest:

- i) Move out of snakes range.
- ii) Do not put ice on wound, do not apply a tourniquet, and do not excise the bite area.
- iii) Put the victim at rest, lying down.
- iv) Immobilize the bitten area and keep it below heart level.
- v) Try and note what the snake looked like.
- vi) Transport the person to a medical facility.

5. Relocation of dens may be an option, but it is not known if this is successful as yet.

SNAKES OF ALBERTA

It is important to note that snakes can be somewhat variable in color. A more detailed key is included as an appendix for more difficult specimens.



Bullsnake (*Pituophis melanoleucus*)

Description: This larger snake (adults-95-183cm, hatchlings 20-40 cm) has a long, stout body and is yellowish in colour with black, brown, or brick red dorsal blotches. It has distinctive black markings on the upper lip. The belly is yellow with bold black spots.

Dark band extending from eye to angle of jaw. Hisses loudly.

Habitat: Dry, sandy woodlands, cultivated fields, plains, prairies, open brushland, rocky desert.

Distribution: Limited to the short-grass prairie in southern Alberta. Found from Calgary south through Waterton and to the Saskatchewan border. Some records north of Calgary.

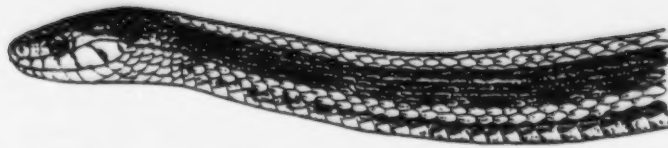


Wandering Garter Snake (*Thamnophis elegans*)

Description: This smaller snake (adult-94-107 cm, 18-20 cm at birth) is brown in colour, with a well-defined dull yellow stripe running down the back and lateral stripes on scale rows 2 and 3. The dark markings on back are rounded.

Habitat: Often found near water, in moist meadows, open grassland to forests. Broadly distributed in all habitat types, although status not known in northerly boreal forest. May occur in large numbers in spring.

Distribution: Widely distributed south of 52°, primarily south and west of the Red Deer River. A few locations have been reported west along the Peace and Athabasca Rivers.



Red-sided Garter Snake (*Thamnophis sirtalis*)

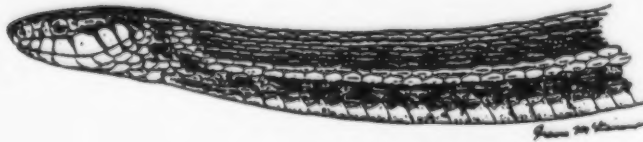
Description: The Red-sided Garter Snake is the most common snake in Alberta. The young are about 15-20cm at birth and adults are 41-66 cm. This snake has a background color of black, olive, or brown and has yellow/green dorsal and lateral stripes (on scale

rows

2 and 3). There are red flecks above the lateral lines on scales or on skin inbetween.

Habitat: Found in meadows, marshes, irrigation and drainage ditches, damp woodlands, farms, and parks. Broad habitat preferences. Chiefly a resident of the boreal and aspen mixedwood ecoregions, and found wherever water is present.

Distribution: Found throughout Alberta from Wood Buffalo down through Waterton.

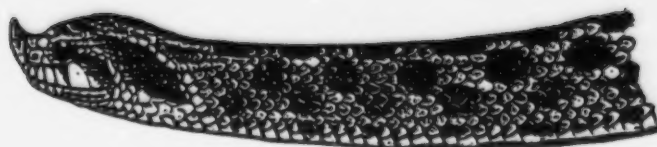


Plains Garter Snake (*Thamnophis radix*)

Description: This Garter Snake can be confused with the the Red-sided Garter Snake. It is also black, but does not have red flecks. Its dorsal stripe is bright orange with yellow/green lateral stripes on scale rows 3 and 4. Black bars on upper lip.

Habitat: Also has wide habitat preferences. Found in wet meadows, boggy areas, parks, open prairies, margins of lakes, prairie ponds, streams, and dugouts, and river valleys.

Distribution: Found south of Cold Lake, mostly in eastern Alberta. Occurs as far west as Calgary in its southern range. Most common in southeastern corner of the province. Greatly reduced in numbers because of building activities and pesticides.

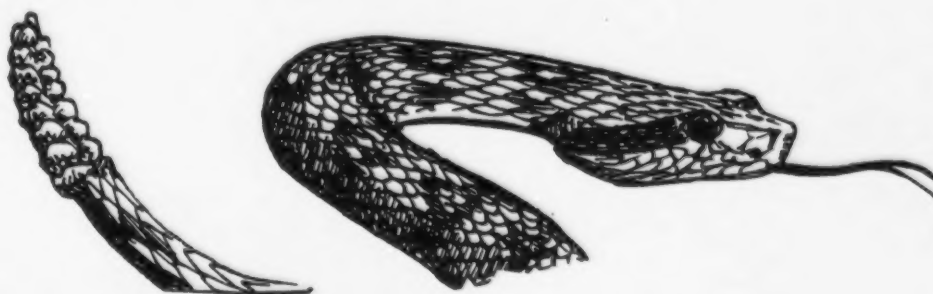


Western Hognose Snake (*Heterodon nasicus*)

Description: A small to medium sized, heavy-bodied snake (adult-38-63.5 cm, 14-19.7 cm at hatching). Tan coloured with black or greyish blotches on the back. Large, jet black ventral areas interspersed with white or yellow. Snout is sharply upturned.

Habitat: Shows preference for sandy gravelly areas in the prairies, scrublands, and river flatbeds. Restricted to the short-grass prairie region.

Distribution: Only found in southeastern Alberta, from the Montana border north to the Red Deer and primarily east of Orion and Medicine Hat. Probably occurs as far north as Drumheller.



Prairie Rattlesnake (*Crotalus viridis*)

Description: A medium-sized snake (adult-89-140 cm, 21.5-28 cm at birth). Brownish blotches down back but narrow and joining with lateral markings to form bands near tail. Smaller blotches on sides. The head is broad and triangular. Tail has a lobate rattle on it. Eyes have vertical pupils and two lines on head, one behind the eye passing above the corner of the mouth. When molested it will coil, raise its head, shake its rattle, and strike.

Habitat: Found in drier areas of grassland and sage brush. Also found in farm fields, rocky outcrops, talus slopes, stony canyons.

Distribution: Found in the short-grass prairie in the southeast. Found south of 51°N and east of 112°W.

Conclusion

I hope this information has helped with some of the questions regarding snakes in Alberta. If you should have further questions, please contact Lisa Takats at (403) 422-9536. Snakes are still a relatively unknown group of animals, with very little information published. The Wildlife Management Division has created The Alberta Snake Hibernaculum Inventory to help us better understand the distribution and abundance of snakes in Alberta. If you or someone you know has a location of a snake hibernaculum, please take the time to complete a datasheet (including in back of this booklet), and send it to: Alberta Environmental Protection and Alberta Conservations Association Snake Hibernaculum Inventory, 7th floor, O.S. Longman Building, 6909-116 Street, Edmonton, Alberta T6H 4P2.

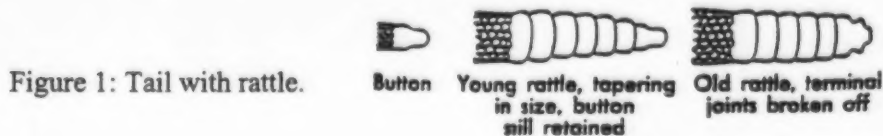
References

For more information on snakes, I have provided some references below.

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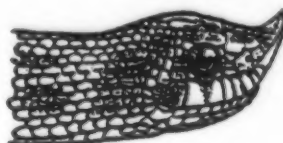
Appendix: Key to Snakes of Alberta (Russell and Bauer 1993, Conat and Collins 1991).

1. a) Tail with rattle (Fig 1), body stout, head distinctly triangular **Prairie Rattlesnake**
b) Tail without rattle, head not triangular 2



2. a) Rostral scale enlarged, upturned (Fig. 2) **Hognose Snake**
b) Rostral scale not enlarged, not upturned 3

Figure 2: Rostral scale upturned, enlarged.



3. a) Four prefrontal scales (Fig. 3a) **Bullsnake**
b) Two prefrontal scales (Fig. 3b) 4



Figure 3: a) four prefrontal scales, b) two prefrontal scales.

4. a) Lateral stripes on 3rd and 4th rows of dorsal scales (Fig. 4a) **Plains Garter Snake**
b) Lateral stripes on 2nd and 3rd rows of dorsal scales (Fig. 4b) 5



Figure 4: Lateral stripes on a) 3rd and 4th rows, b) 2nd and 3rd rows.

5. a) Eight upper labials, chin shields approximately same size (Fig. 5). **Wandering Garter Snake**
b) Seven upper labials, posterior chin shields longer than anterior . . . **Red-sided Garter Snake**

Figure 5: Upper labials.



ALBERTA SNAKE HIBERNACULUM INVENTORY

All snakes of Alberta spend the winter below the surface of the ground to avoid cold temperatures.

Snakes typically hibernate in dens called hibernacula, often aggregating in large numbers. Hibernacula provide snakes with a safe, humid place, where temperatures remain above freezing. The temperatures in hibernacula remain fairly constant because of the insulating effects of the earth and the fact that they are below or deeper than the frost line. Snakes need hibernacula because they are poikilothermic (body temperature changes with their surroundings), and are unable to regulate their own body temperature. These dens are often found in areas with a rocky subsurface and naturally occurring pits, fissures or crevices. Snakes also frequently choose rocky outcrops or sinkholes, burrows of small to medium size mammals and even occasionally people's cellars! In spring the snakes emerge, mate and disperse from the hibernaculum. In the fall the snakes will congregate back in the hibernaculum to spend the winter.

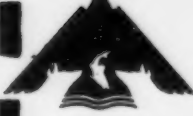
Naturalists, biologists and landowners have expressed concern that garter snake numbers have declined over the past years. Overall hog-nosed snake populations have also followed this trend. These species are important components of the ecosystem, and require immediate attention. The Alberta Conservation Association and Natural Resources Services - Fish and Wildlife have created a snake hibernaculum inventory to help us better understand the distribution and abundance of snakes in Alberta. Locations that are sent in will be put into a database and will be used to manage land-use issues, and afford protection to these important sites.

Six species of snakes occur in Alberta; three garter snake species (wandering garter snake, plains garter snake, and the red-sided garter snake), the bull snake, the hog-nosed snake, and the prairie rattlesnake. The following is a table for identifying the various species.

| Species | Diagnostic characteristics |
|------------------------|---|
| Wandering garter snake | Brown in color with a dull yellow dorsal stripe |
| Plains garter snake | Black in color, with an orange dorsal stripe, and two pale yellow lateral Stripes |
| Red-sided garter snake | Black in color with yellow/green dorsal and lateral stripes, usually with red flecks above lateral stripes |
| Bull snake | Large yellowish brown snake with black, brown or brick red dorsal blotches. |
| Hog-nosed snake | Short stout tan colored snake with rough scales, an up turned snout and black blotches on the back. |
| Prairie rattlesnake | Tan or brown snake with dark blotches or cross band pattern on back, Distinctive rattle on tail and broad triangular head |

If you, or someone you know has a location of a snake hibernaculum in the province, please take the time to complete a datasheet, and send it to: **Snake Hibernaculum Inventory**
Alberta Conservation Association/Natural Resources Service-Fish and Wildlife,
7th fl. O.S. Longman Bldg., 6909-116 Street, Edmonton, Alberta T6H 4P2.





ALBERTA SNAKE HIBERNACULUM INVENTORY DATA SHEET



PERSONAL INFORMATION

NAME OF OBSERVER: _____
FIRST/LAST

ADDRESS: _____
STREET/BOX/APT.#

CITY/TOWN POSTAL CODE

PHONE: _____

OBSERVATION LOCATION

LEGAL LAND DESCRIPTION:

LATITUDE: _____ ° _____ ' _____ " LONGITUDE: _____ ° _____ ' _____ "

UTM:

REFERENCE MERIDIAN: _____ NORTHING: _____ EASTING: _____

ATS:

QUARTER: NE NW SW SE SECTION: _____ TOWNSHIP: _____ RANGE: _____ WEST OF: 4 5 6

LAND DISPOSITION: PRIVATE PROVINCIAL FEDERAL LANDOWNER: _____

ACTIVITY INFORMATION

MOST RECENT OBSERVATION: _____ / _____ / _____
D M Y

CHECK DATES HIBERNACULUM OBSERVED TO BE ACTIVE:

| | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
| | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| | | | | | | | | | | | | |

| SPECIES OBSERVED | APPROX. NUMBER | SPECIES OBSERVED | APPROX. NUMBER |
|-----------------------|----------------|-----------------------------|----------------|
| WESTERN HOGNOSE SNAKE | | RED-SIDED GARTER SNAKE | |
| BULL SNAKE | | WANDERING GARTER SNAKE | |
| PRAIRIE RATTLESNAKE | | WESTERN PLAINS GARTER SNAKE | |

CONFIDENCE IN SNAKE SPECIES IDENTIFICATION:

1 2 3 4 5
UNSURE MODERATELY SURE POSITIVE

MAP OF HIBERNACULUM LOCATION/ACCESS ROUTE(S)

FEEL FREE TO ATTACH ADDITIONAL PAGES OF INFORMATION OR PHOTOCOPIED MAPS OR PICTURES

ADDITIONAL DETAILS: (i.e.: Habitat/Hazards/Map/Landowner/Access/Location/Observations/etc.)

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**PLEASE SEND COMPLETED DATA SHEETS TO: ALBERTA SNAKE HIBERNACULUM INVENTORY,
ALBERTA CONSERVATION ASSOCIATION/
NATURAL RESOURCES SERVICE -
FISH AND WILDLIFE, 7TH O.S. LONGMAN BLDG.
6909-116 STREET, EDMONTON, ALBERTA T6H 4P2**

**QUESTIONS? PLEASE CONTACT LISA TAKATS (422-9536) OR BRUCE TREICHEL (422-9535).
IF YOU ARE CALLING LONG DISTANCE DIAL 310-0000 AND ASK FOR ONE OF THE
NUMBERS LISTED ABOVE.**